

AMENDMENTS TO THE SPECIFICATION

Before line 1 of the specification, please insert the following new paragraph:

This application is a continuation of co-pending Application No. 10/321,666 filed on December 18, 2002, the entire contents of which are hereby incorporated by reference and for which priority is claimed under 35 U.S.C. § 120; and this application claims priority of Application No. 2001-386162 filed in Japan on December 19, 2001 under 35 U.S.C. § 119.

Please amend the paragraph beginning on page 11, line 10 and ending on page 11, line 15 as follows:

A GPS ~~receiver~~ antenna block including two antennas ANT1, ANT2 receives waves transmitted from the GPS satellites sat1, sat2, satN, downconverts received signals into intermediate frequency (IF) signals. The IF signals are amplified by an amplifier built in the GPS ~~receiver~~ antenna block and delivered to the GPS receiver block.

Please amend the paragraph beginning on page 14, line 3 and ending on page 14, line 12 as follows:

When the observables are double phase differences, the observable vector y_k is a double phase difference, the state vector x_k and the observable matrix H_k are expressed as:

$$x_k = \begin{bmatrix} b_k \\ a_k \end{bmatrix}, \quad H_k = [B_k, A_k] \dots\dots\dots (3)$$

respectively, where B_k is a direction cosine matrix, b_k is a baseline vector, A_k is a quantity equal to ~~wavelenth~~ wavelength times a unit matrix and a_k is a floating ambiguity. The direction cosine matrix B_k can be calculated from a single measurement and the quantity ~~wavelenth~~ wavelength times the unit matrix A_k is a fixed value calculated from the ~~wavelenth~~ wavelength of the carrier.

Please amend the paragraph beginning on page 14, line 16 and ending on page 14, line 21 as follows:

If the distance is expressed in terms of ~~wavelenth~~ wavelengths times the unit matrix, A_k can be replaced by a unit

matrix I. Thus equation (4) can be rewritten in a simplified form shown below:

$$y_k = [B_k, I] \begin{bmatrix} b_k \\ a_k \end{bmatrix} + v_k = B_k b_k + a_k + v_k \dots\dots\dots (5)$$

Please amend the paragraph beginning on page 17, line 12 and ending on page 18, line 4 as follows:

First, the baseline vector b_k is measured with the carrier-phase-based relative positioning device held at a fixed location and, then, a double phase difference and a direction cosine difference matrix are determined. Using these data and assuming that the double phase difference calculated from the measured baseline vector b_k and the direction cosine difference matrix is a true value, the difference between that value and the double phase difference calculated from radio wave information received from positioning satellites is calculated. Since the observation noise v_k expressed in terms of the double phase difference is sufficiently small compared with the ~~wavelength~~ wavelength of the carrier, the observation noise v_k can be regarded as a fractional part of the double phase difference expressed in terms of the number of carrier wave cycles. Thus,

the variance of this fractional part is calculated and a matrix of which diagonal elements are variance values is used as the covariance matrix R_k of the observation noise v_k .

Please amend the paragraph beginning on page 27, line 4 and ending on page 27, line 5 as follows:

In such cases, the integer ambiguity can be determined more efficiently by using the verification method of FIG. 4.